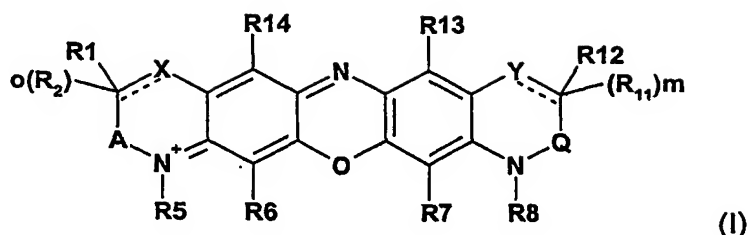


CLAIMS

1. Compounds of formula I



wherein

X and Y represent CH, CH₂ or a divalent or trivalent heteroatom under the proviso that X and Y are not simultaneously CH or CH₂;

m and o represent independently of each other 0 or 1, with the proviso that

if m is 0 then the dotted line between Y and the neighboring C atom represents a bond and Y is CH or a trivalent heteroatom,

if m is 1 then the dotted line between Y and the neighboring C atom is absent and Y is CH₂ or a divalent heteroatom,

if o is 0 then the dotted line between X and the neighboring C atom represents a bond and X is CH or a trivalent heteroatom,

if o is 1 then the dotted line between X and the neighboring C atom is absent and X is CH₂ or a divalent heteroatom;

A represents (CR₃R₄)_p and Q represents (CR₉R₁₀)_n;

n and p represent independently of each other 0 or 1;

R₆, R₇, R₁₃, and R₁₄ denote independently of each other hydrogen, halogen, (C₁₋₄)alkyl, (C₁₋₄)alkylSO₂, SO₃H, carboxy, (C₁₋₄)alkoxy carbonyl, (C₁₋₄)alkoxy, OH or NR₁₅R₁₆;

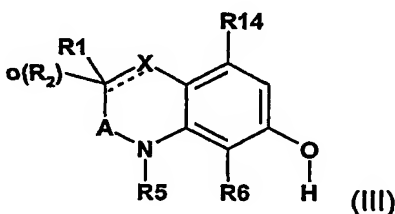
R₁, R₂, R₃, R₄, R₉, R₁₀, R₁₁ and R₁₂ denote independently of each other hydrogen, (C₁₋₄)alkyl, carboxy, (C₁₋₄)alkoxy carbonyl or (C₁₋₄)alkoxy, or, when X is CH or CH₂ then R₁ and R₂ can also be OH or NR₁₅R₁₆, or when Y is CH or CH₂ then R₁₁, R₁₂ can also be OH or NR₁₅R₁₆;

R₅, R₈, R₁₅ and R₁₆ are independently of each other hydrogen, (C₁₋₄)alkyl, (C₁₋₄)alkoxy, R₁₇O-C(O)-(C₁₋₄)alkyl or (reactive group)-(C₁₋₄)alkyl; and

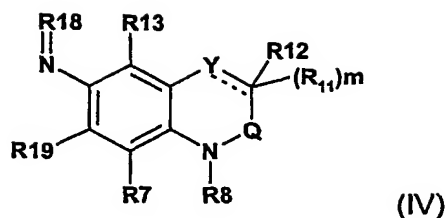
R₁₇ represents hydrogen or (C₁₋₄)alkyl;

in free base or acid addition salt form.

2. A compound of formula I according to claim 1 in free base or acid addition salt form wherein X is O, S or CH₂ and Y is O, S or CH₂ with the proviso that X and Y are not both simultaneously CH₂.
3. A compound of formula I according to claim 1 wherein said compound is selected from 4,8-dimethyl-2,3,4,9,10,11-hexahydro-1,6-dioxo-4,13-diaza-8-azonia-pentacen chloride; 8-ethyl-4-methyl-2,3,4,9,10,11-hexahydro-1,6-dioxo-4,13-diaza-8-azonia-pentacen chloride; 4,8-dimethyl-3,8,9,10-tetrahydro-2H-1,6,11-trioxo-8,13-diaza-4-azonia-pentacen tetrafluoroborate; 4,8-dimethyl-2,3,9,10-tetrahydro-4H-1,6-dioxo-11-thia-4,13-diaza-8-azonia-pentacen chloride; and 8-(3-ethoxycarbonyl-propyl)-4-methyl-3,8,9,10-tetrahydro-2H-1,6,11-trioxo-8,13-diaza-4-azonia-pentacen chloride.
4. A composition comprising a compound according to of any one of claims 1-3 and a pharmaceutically acceptable excipient or diluent.
5. A process for the production of a compound of formula I or a salt thereof, comprising the steps of reacting a phenol derivative of formula III



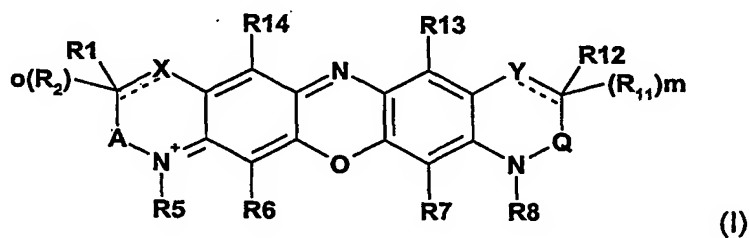
wherein the radicals and symbols A, X, R₁, R₂, R₅, R₆, R₁₄ and o have the meanings as defined in claim 1 for a compound of formula I, with a nitroso or diazo compound of formula IV



wherein the radicals and symbols Q, Y, R₇, R₈, R₁₁, R₁₂, R₁₃ and m have the meanings as defined in claim 1 for a compound of formula I, R₁₈ represents oxo or p-nitrophenyl-N= and R₁₉ represents hydroxy;
and recovering the resulting compound of formula I in free base form or in form of an acid addition salt.

6. A method of labeling target structures in the brain comprising:

(i) applying a composition comprising a compound of formula I



wherein

X and Y represent CH, CH₂ or a divalent or trivalent heteroatom under the proviso that X and Y are not simultaneously CH or CH₂;

m and o represent independently of each other 0 or 1, with the proviso that

if m is 0 then the dotted line between Y and the neighboring C atom represents a bond and Y is CH or a trivalent heteroatom,

if m is 1 then the dotted line between Y and the neighboring C atom is absent and Y is CH₂ or a divalent heteroatom,

if o is 0 then the dotted line between X and the neighboring C atom represents a bond and X is CH or a trivalent heteroatom,

if o is 1 then the dotted line between X and the neighboring C atom is absent and X is CH₂ or a divalent heteroatom;

A represents $(CR_3R_4)_p$ and Q represents $(CR_9R_{10})_n$;

n and p represent independently of each other 0 or 1;

R_6 , R_7 , R_{13} , and R_{14} denote independently of each other hydrogen, halogen, (C_{1-4}) alkyl, (C_{1-4}) alkylSO₂, SO₃H, carboxy, (C_{1-4}) alkoxy carbonyl, (C_{1-4}) alkoxy, OH or NR₁₅R₁₆;

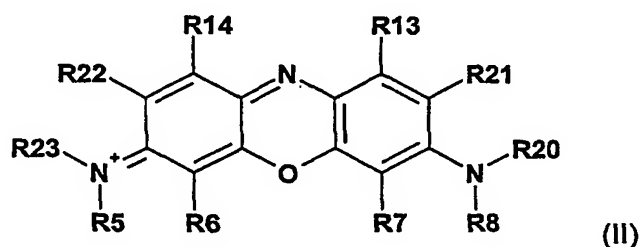
R_1 , R_2 , R_3 , R_4 , R_9 , R_{10} , R_{11} and R_{12} denote independently of each other hydrogen, (C_{1-4}) alkyl, carboxy, (C_{1-4}) alkoxy carbonyl or (C_{1-4}) alkoxy, or, when X is CH or CH₂ then R_1 and R_2 can also be OH or NR₁₅R₁₆, or when Y is CH or CH₂ then R_{11} , R_{12} can also be OH or NR₁₅R₁₆;

R_5 , R_8 , R_{15} and R_{16} are independently of each other hydrogen, (C_{1-4}) alkyl, (C_{1-4}) alkoxy, R₁₇O-C(O)-(C₁₋₄)alkyl or (reactive group)-(C₁₋₄)alkyl; and

R₁₇ represents hydrogen or (C_{1-4}) alkyl;

in free base or acid addition salt form,

or of formula II



wherein

R_6 , R_7 , R_{13} , and R_{14} denote independently of each other hydrogen, halogen, (C_{1-4}) alkyl, (C_{1-4}) alkylSO₂, SO₃H, carboxy, (C_{1-4}) alkoxy carbonyl, (C_{1-4}) alkoxy, OH or NR₁₅R₁₆, and

R_{21} and R_{22} are hydrogen, (C_{1-4}) alkyl, (C_{1-4}) alkoxy, phenyl, phenylalkyl, carboxy or halogen;

R_{14} and R_{22} together with the carbon atoms to which they are attached can also form a saturated or unsaturated ring;

R_{21} and R_{13} together with the carbon atoms to which they are attached can also form a saturated or unsaturated ring;

R_5 , R_8 , R_{20} and R_{23} are hydrogen, (C_{1-4}) alkyl, (C_{1-4}) alkoxy, polyoxyhydrocarbyl, phenyl, phenylalkyl;

R_8 and R_{20} together with the nitrogen atom to which they are attached can form a saturated or unsaturated ring,

R_{23} and R_5 together with the nitrogen atom to which they are attached can form a saturated or unsaturated ring,

R₂₂ and R₂₃ together with the atoms to which they are attached can form a saturated or unsaturated ring,

R₅ together with R₆ together with the atoms to which they are attached can form a saturated or unsaturated ring,

R₇ together with R₈ together with the atoms to which they are attached can form a saturated or unsaturated ring,

R₂₀ together with R₂₁ together with the atoms to which they are attached can form a saturated or unsaturated ring,

(ii) allowing sufficient time for said compound to be chemically associated with the target structure in the brain, and

(iii) detecting said compound using near-infrared radiation.

7. The method according to claim 6 wherein said target structures are amyloid plaques.

8. The method according to claim 7 for identifying diseases related to amyloid plaque generation and/or aggregation.

9. The method according to claim 7 or claim 8 for identifying Alzheimer's disease.

10. Use of a compound of formula I according to any one of claims 1-3 in free base or acid addition salt form as a near-infrared imaging agent.

11. Use of a compound of formula II as defined in claim 6 as a near-infrared imaging agent.

12. Use according to claims 10 or 11 as a near-infrared imaging agent to image amyloid plaques.

13. A conjugate comprising a compound of formula I according to any one of claims 1-3 covalently linked to a biomolecule through a reactive group.

14. A conjugate according to claim 13 wherein the biomolecule is selected from the group consisting of nucleoside, nucleotide, oligonucleotide, nucleic acid, protein, peptide, amino

acid, polysaccharide, oligosaccharide, monosaccharide, drug or a small molecule having a molecular weight of less than 500.

15. A conjugate according to claim 13 or 14 capable of being detected using near-infrared radiation.